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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/898,439	07/05/2001	Tue Nguyen	TEGL-01165US0	1885

23910 7590 07/20/2009

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EXAMINER	
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ART UNIT	**PAPER NUMBER**
2892	

MAIL DATE	DELIVERY MODE
07/20/2009	PAPER

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte TUE NGUYEN and TAI DUNG NGUYEN

Appeal 2009-001022
Application 09/898,439
Technology Center 2800

Decided:[1] July 20, 2009

Before JOHN C. MARTIN, JOSEPH F. RUGGIERO, and
THOMAS S. HAHN, *Administrative Patent Judges*.

RUGGIERO, *Administrative Patent Judge*.

DECISION ON APPEAL

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[1] The two-month time period for filing an appeal or commencing a civil action, as recited in 37 C.F.R. § 1.304, begins to run from the Decided Date shown on this page of the decision. The time period does not run from the Mail Date (paper delivery) or Notification Date (electronic delivery).

STATEMENT OF THE CASE

Appellants appeal under 35 U.S.C. § 134 from the Final Rejection of claims 30, 35, 36, and 38, which are all of the pending claims. We have jurisdiction under 35 U.S.C. § 6(b).

We affirm.

Rather than reiterate the arguments of Appellants and the Examiner, reference is made to the Brief (supplemental, filed October 1, 2007), the Answer (mailed January 4, 2008), and the Reply Brief (filed March 4, 2008) for the respective details. Only those arguments actually made by Appellants have been considered in this decision. Arguments which Appellants could have made but chose not to make in the Briefs have not been considered and are deemed to be waived. *See* 37 C.F.R. § 41.37(c)(1)(vii).

Appellants' Invention

Appellants' invention relates to semiconductor processing using a helical ribbon electrode having flat concentric spirally connected coils with a sheet of dielectric between adjacent coils. The helical ribbon electrode is coupled to the output of a radio frequency (RF) plasma generator, which is coupled to a process chamber to excite a processing gas. (*See generally* Spec. 4:3-16, 12:5-9).

Claim 30 is illustrative of the invention and reads as follows:

> 30. An improved apparatus for semiconductor processing, the improvement comprising a helical ribbon electrode, wherein the helical ribbon electrode comprises a compressed cylindrical helix having a plurality of flat concentric spiral coils separated from each

other by a sheet of dielectric material, each said flat concentric spiral coil comprising a ribbon-like form, said ribbon-like form comprising a width and a thickness wherein the width is substantially greater than the thickness, the width lying in a plane that faces another of said plurality of flat concentric spiral coils, and the thickness corresponding to a plane that is substantially parallel to a direction of stacking of said plurality of flat concentric spiral coils.

The Examiner's Rejections

The Examiner relies on the following prior art to show unpatentability:

Amagasa	US 4,750,077	Jun. 7, 1988
Ye	US 6,488,862 B1	Dec. 3, 2002 (filed Oct. 27, 1999)

Claims 30 and 38 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Amagasa.

Claims 35 and 36 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Ye in view of Amagasa.

ISSUES

The pivotal issues before us in determining whether the Examiner correctly rejected the appealed claims are whether Appellants have demonstrated that the Examiner erred in finding:

a) Amagasa's disclosure of an inductive coil structure with spirally connected ribbon shaped coils having dielectric material between the adjacent coils corresponds to the claimed helical ribbon electrode and, if so,

b) the obviousness to the ordinarily skilled artisan of substituting the inductive coil of Amagasa for the inductive coil of Ye that is coupled to the output of an RF plasma generator used to excite processing gas in a process chamber.

FINDINGS OF FACT

The record supports the following relevant findings of fact (FF) by a preponderance of the evidence:

1. Amagasa discloses (Fig. 4; col. 1, ll. 8-12, col. 4, ll. 12-28) a helically-shaped ribbon inductive coil 50 with dielectric material 54 between adjacent spirally connected coils 52.

2. Amagasa further discloses (Fig. 4) that the width of the coil turns 52 is greater than the thickness, the width of each coil lies in a plane that faces another of the coils, and the thickness of each coil corresponds to a plane that is parallel to the stacking of the coils.

3. Ye discloses (Fig. 1) a process chamber 10 for semiconductor processing, which includes an RF plasma generator 18 coupled to the process chamber 10 to excite a processing gas through gas inlet 26.

4. Ye further discloses (Fig. 1; col. 8, ll. 5-45) that the process chamber 10 includes an inductive coil electrode 12, which is coupled to the output of plasma generator 18 to provide RF power within the processing chamber.

PRINCIPLES OF LAW

1. ANTICIPATION

It is axiomatic that anticipation of a claim under § 102 can be found if the prior art reference discloses every element of the claim. *See In re King*, 801 F.2d 1324, 1326 (Fed. Cir. 1986); *Lindemann Maschinenfabrik GMBH v. Am. Hoist & Derrick Co.*, 730 F.2d 1452, 1458 (Fed. Cir. 1984).

In rejecting claims under 35 U.S.C. § 102, "[a] single prior art reference that discloses, either expressly or inherently, each limitation of a claim invalidates that claim by anticipation." *Perricone v. Medicis Pharm. Corp.*, 432 F.3d 1368, 1375 (Fed. Cir. 2005) (citing *Minn. Mining & Mfg. Co. v. Johnson & Johnson Orthopaedics, Inc.*, 976 F.2d 1559, 1565 (Fed. Cir. 1992)). "Anticipation of a patent claim requires a finding that the claim at issue 'reads on' a prior art reference." *Atlas Powder Co. v. IRECO, Inc.*, 190 F.3d 1342, 1346 (Fed. Cir. 1999) ("In other words, if granting patent protection on the disputed claim would allow the patentee to exclude the public from practicing the prior art, then that claim is anticipated, regardless of whether it also covers subject matter not in the prior art.") (citations omitted).

During examination of a patent application, a claim is given its broadest reasonable construction "'in light of the specification as it would be interpreted by one of ordinary skill in the art.'" *In re Am. Acad. of Sci. Tech Ctr.*, 367 F.3d 1359, 1364 (Fed. Cir. 2004) (quoting *In re Bond*, 910 F.2d 831, 833 (Fed. Cir. 1990)). "[T]he words of a claim 'are generally given their ordinary and customary meaning.'" *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (quoting *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996)).

If the body of a claim fully and intrinsically sets forth all of the limitations of the claimed invention, and the preamble merely states, for example, the purpose or intended use of the invention, rather than any distinct definition of any of the claimed invention's limitations, then the preamble is not considered a limitation and is of no significance to claim construction. *Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1305 (Fed. Cir. 1999).

2. OBVIOUSNESS

In rejecting claims under 35 U.S.C. § 103, it is incumbent upon the Examiner to establish a factual basis to support the legal conclusion of obviousness. *See In re Fine*, 837 F.2d 1071, 1073 (Fed. Cir. 1988). In so doing, the Examiner must make the factual determinations set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966) (stating that 35 U.S.C. § 103 leads to three basic factual inquiries: the scope and content of the prior art, the differences between the prior art and the claims at issue, and the level of ordinary skill in the art). "[T]he examiner bears the initial burden, on review of the prior art or on any other ground, of presenting a *prima facie* case of unpatentability." *In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992). Furthermore,

> "there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness" . . . [H]owever, the analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.

KSR Int'l Co. v. Teleflex Inc., 550 U.S. 398, 418 (2007) (quoting *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)).

Also, "'[t]he combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.'" *Leapfrog Enters., Inc. v. Fisher-Price, Inc.*, 485 F.3d 1157, 1161 (Fed. Cir. 2007) (quoting *KSR*, 550 U.S. at 416). "One of the ways in which a patent's subject matter can be proved obvious is by noting that there existed at the time of invention a known problem for which there was an obvious solution encompassed by the patent's claims." *KSR*, 550 U.S. at 419-20.

ANALYSIS

35 U.S.C. § 102(b) REJECTION

Appellants' arguments in response to the Examiner's anticipation rejection, based on Amagasa, of independent claims 30 and 38 assert that the Examiner has not shown how each of the claimed features is present in the disclosure of Amagasa so as to establish a prima facie case of anticipation. Appellants' arguments (App. Br. 5-6; Reply Br. 1-2) focus on the contention that, in contrast to the claimed helical electrode structure, Amagasa's helical coil structure is an inductive coil, and not an electrode. In a related argument (App. Br. 5), Appellants contend that Amagasa does not disclose a sheet of dielectric material between the coils of the helical structure as claimed.

We do not find Appellants' arguments to be persuasive of any error in the Examiner's stated position. Initially, we agree with the Examiner's finding (Ans. 3, 7) that Amagasa has an unambiguous disclosure (FF 1) of a dielectric material 54 between the adjacent coils 52 of the coil structure 50.

We also agree with the Examiner's determination (Ans. 7) that the language "for coupling to the output of a RF generator" in the preamble of claim 38 is a mere statement of intended use, which is not entitled to any patentable weight. *See Pitney Bowes*, 182 F.3d at 1305. The body of claim 38 provides a structurally complete recitation of the structure of the claimed helical ribbon electrode and uses the preamble only to state a purpose or intended use for the electrode.

We also find no error in the Examiner's finding (Ans. 7) that the helical coil structure 52 of Amagasa can be reasonably interpreted as corresponding to the claimed "electrode." There is no definition of the term "electrode" in the Specification and Appellants have not provided evidence that the term has any special meaning to an ordinarily skilled artisan. Accordingly, we look to the ordinary and customary meaning of the term. *See Phillips*, 415 F.3d at 1312.

As recognized by Appellants, "[a]n electrode is a conductor" (App. Br. 5), a characteristic which is exhibited by the coil turns 52 of Amagasa's coil 50 ("coil conductor 52" Amagasa, col. 4, l. 15). We note that, at page 1 of the Reply Brief, Appellants have provided a narrow specialized definition of "electrode" from Dictionary.com that is directed to charge carriers in the collector or emitter structure of a semiconductor device. We find, however, that the helical coil structure of Amagasa fits precisely within the more generalized definition of "electrode" provided by Dictionary.com as "[a] conductor through which an electric current enters or leaves a substance (or a vacuum) whose electrical characteristics are being measured, used, or manipulated." Dictionary.com, Electrode, http://dictionary.reference.com/browse/electrode (last visited July 8, 2009).

Further, the fact that Amagasa's coil structure 52 may be utilized as an induction coil (Amagasa, col. 1, l. 9) does not preclude it from being considered as an "electrode" as Appellants' arguments impliedly recognize ("not *necessarily* an inductor") (App. Br. 5 (emphasis added)). Also, Appellants' own Specification (10:2-3) recognizes that an electrode can be of an inductance coupling type.

In view of the above discussion, since Appellants have not demonstrated that the Examiner erred in finding that all of the claimed limitations are present in the disclosure of Amagasa, the Examiner's 35 U.S.C. § 102(b) rejection of independent claims 30 and 38 is sustained.

35 U.S.C. § 103(a) REJECTION

The Examiner's obviousness rejection of independent claim 35 (and its dependent claim 36) based on the combination of Ye and Amagasa is sustained as well. Independent claim 35 differs from previously discussed independent claims 30 and 38 in that the helical ribbon electrode structure is positively recited as being coupled to the output of an RF plasma generator, which in turn is coupled to a process chamber to excite a processing gas.

In addressing the requirements of claim 35, the Examiner has combined the teachings of Ye, directed to a semiconductor processing chamber with a coil electrode coupled to a RF power generator, with the helical electrode structure teachings of the previously discussed Amagasa reference. Appellants' arguments in response (App. Br. 7-8; Reply Br. 2) attacking the Examiner's proposed combination focus on the contention that,

while Ye and Amagasa both teach spiral coils, Amagasa's coil is not an electrode as Appellants have previously argued.[2]

We do not find Appellants' arguments to be persuasive. Initially, we refer to our earlier discussion where we found ample evidence to support the Examiner's conclusion that an ordinarily skilled artisan would have recognized Amagasa's helical coil as being an "electrode." Also, it is apparent from the disclosures of both Ye and Amagasa that the coils used by Ye and Amagasa are described as being inductive coils (FFs 1 and 4).

Further, our review of the Examiner's stated position (Ans. 6-8) reveals that the Examiner has provided an articulated line of reasoning with a rational underpinning to support the conclusion of obviousness to the ordinarily skilled artisan of substituting the inductive coil of Amagasa, which has dielectric material between the adjacent turns of the coil, for the inductive coil of Ye. Therefore, we remain unconvinced by Appellants' arguments against the combinability of the references since, using *KSR* and *Leapfrog* standards, the evidence provided by the Examiner supports a finding that substituting the inductive coil of Amagasa for that of Ye would amount to nothing more than the substitution of one known element for another that would yield a predictable result.

CONCLUSION

Based on the findings of facts and analysis above, we conclude that Appellants have not shown that the Examiner erred in rejecting claims 30

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[2] It is noteworthy that, while both Amagasa and Ye disclose spiral inductive coils, Appellants recognize (Reply Br. 2) that Ye's coil is an electrode while, nonetheless, repeatedly arguing that the inductive coil of Amagasa is not an electrode.

and 38 for anticipation under 35 U.S.C. § 102(b), nor in rejecting claims 35 and 36 for obviousness under 35 U.S.C. § 103(a).

DECISION

The Examiner's decision rejecting claims 30 and 38 under 35 U.S.C. § 102(b) and claims 35 and 36 under 35 U.S.C. § 103(a) is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv) (2007).

AFFIRMED

babc

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